

REMARKS

By this amendment: (1) two sheets of formal drawings containing FIGS. 19, 20 and 24 are submitted as requested by the Examiner to replace the formal drawings submitted November 13, 2003; (2) the first paragraph of page 1 of the specification under the heading "RELATED CASES" has been amended as requested by the Examiner; and (3) claims 3, 5, 11 and 30 have been amended as suggested by the Examiner to make them allowable.

Claims 1-12 and 28-30 are now in this application. In view of the above amendments and the remarks hereinafter, it is respectfully requested that this application be reconsidered.

As requested by the Examiner, a copy of the formal drawings received by the U.S. Patent Office on November 13, 2003, are resubmitted herewith.

The objection to the "Related Cases" section of specification has been cured by this amendment.

The rejection of claims 2-8 and 28-30 under 35 U.S.C. 112, second paragraph, is respectfully traversed as applied to the claims now in this application.

Firstly, relative terms do not always make a claim indefinite. They render a claim indefinite only when they prevent a person of ordinary skill in the art from knowing the scope of the claim. That is not the case here even assuming *arguendo* that the term "low bandwidth" was not defined.

In claim 2, the term "low bandwidth" is part of the phrase "low bandwidth, whereby sensitivity is improved". This phrase is clear to a person of ordinary skill in the art and means bandwidth sufficiently low to substantially improve sensitivity. A person of ordinary

skill in the art can tell when sensitivity is substantially improved by low bandwidth. Claim 3 not only incorporates this phrase but provides information about one way of obtaining the low bandwidth.

Secondly, the term "low bandwidth" is defined in the specification on pages 4 , 37 and 38. For example on page 37, line 19 through page 38, line 22, the specification states:

"Preferably the energy storing circuit is a non-switching circuit with low bandwidth and a flat-topped response to an impulse. This improves the signal to noise ratio.

A low pass filter can perform this function and a one pole low pass filter such as shown at 192E and 192F by way of example, provides satisfactory results, about a 6 times increase in signal to noise ratio. Still better results (about twice) can be obtained from a three pole, one or two percent overshoot filter with combined minimum frequency bandwidth and fast rise time such as those described by Jess and Schuessler, in "IEEE Transactions on Circuit Theory (June 1965)" and "On the Design of Pulse-Forming Networks" IEEE Transactions on Circuit Theory, Vol. CT-12, No.3, pp.393-400, (Sept. 1965). Such filters have an almost maximum-flat peak output response which optimizes energy storage. The purpose of the energy storing circuit is to provide close to 100 percent equality over the collection of signals from the photodetectors with uniform weighing of the signals from different ones of the photodetectors in spite of the dead time for readout caused by the multiplexer 145, and also to provide faster rise time compared to a given noise bandwidth. An example of a suitable filter for a $\frac{1}{2}$ to one second multiplex cycle time and little response speed degradation, is the "30.10.10.D" filter on Table II, p. 399 (*ibid*, Sept. 1965), with all table elements multiplied by a scale factor of 17.06 Although this series of all-pole filters is specified from optimality at a bandwidth other than noise bandwidth, it can be seen that the optimality value of the elements does not change except by a single scale factor, with respect to how bandwidth is defined. It can also be shown that this filter function is closely optimal for flat-topped pulse response as well as speed/bandwidth response. Because of impedance problems the single-pole stage of the three-pole filter should be connected to the photocell as in FIG. 24. The two-pole output stage is connected between the one-pole input stage and the multiplexer. The one-pole embodiment is the same as FIG. 24 without the added two-pole addition to its left. FIG. 24 as modified shows the three-pole embodiment."

Page 4 of the specification includes similar language.

The rejection of claims 1 and 9 under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 4,678,917 to Helms, et al., in view of U.S. patent 6,019,897 to Horsman, et al., is respectfully traversed.

Neither the patent to Helms et al nor the patent to Horsman, et al., disclose the problem solved by the invention claimed in claims 1 and 9 nor the structure to solve this problem but only components that could possibly be cannibalized from the individual apparatus described in those two patents and reassembled into the invention if the invention had been known. Moreover, there is no teaching that would make it obvious to a person of ordinary skill in the art to combine features of the patent to Helms, et al., with features from the patent to Horsman, et al., to arrive at the invention.

The problem solved is to obtain sufficient energy from each of the photocells receiving the light passing through a corresponding flow cell during the stroke time for which each corresponding one of the photocells is connected to the output circuit during multiplexing for a good signal to noise ratio. Neither of the cited references refers to this problem nor provides a solution to the problem. Helms, et al., has only one flow cell and measures absorbance of several different portions of the light spectrum passing through the same sample at the same time. The energy of each of the portions of the light spectrum that passes through the sample is gathered and it does not need nor use the invention. The apparatus of Horsman, et al., might benefit from the invention but the patent specification of Horsman, et al., does not recognize the problem nor do anything about it.

Even if a combination of Helms, et al., and Horsman, et al., did disclose the invention, it would not negate patentability of claims 1 and 9 because it is not obvious to

combine the teachings of Helms, et al., and Horsman, et al. There is no suggestion of such a combination and the two systems are entirely different and directed to different problems. Only a hindsight knowledge of the invention could cause a person skilled in the art to consider such a combination.

The rejection of claim 2 under 35 U.S.C. 103(a) as being unpatentable over Helms, et al., in view of Horsman, et al., as applied to claim 1 above, and further in view of U.S. patent 4,902,886 to Smisko is respectfully traversed.

Claim 2 is patentable over Helms, et al., and Horsman, et al., for the same reasons as claim 1 from which it depends and Smisko does not change this because Smisko does not teach the problem solved by the invention nor the structure used to solve the problem. Moreover, the Examiner's argument that it is obvious to apply the benefits of low bandwidth to all circuits is untrue and therefore it is untrue to the claimed circuit and does not address the language "non-switching circuit with low bandwidth" particularly in the claimed combination. Indeed some circuits benefit from wide bandwidth.

The rejection of claims 4, 28, and 29 under 35 U.S.C. 103(a) as being unpatentable over Helms, et al., in view of Horsman, et al., and Smisko as applied to claims 1 and 2 above, and further in view of U.S. patent 3,964,864 to Dahms is respectfully traversed.

Claims 4, 28 and 29 define patentably over Helms, et al., Horsman, et al., and Smisko for the same reasons as claim 2 and Dahms does not change this situation. Moreover, Dahms does not make it obvious to extend light guides into a flow cell of a liquid chromatographic system because the flow cell of Dahms measures stationary chlorine and not flowing fluids. Thus, there is no problem of bubbles changing the light absorbance as

there is in liquid chromatograph flow cells through which liquid flows during the measurements.

The rejection of claim 10 under 35 U.S.C. 103(a) as being unpatentable over Helms, et al., in view of Horsman, et al., as applied to claim 1 above, and further in view of U.S. patent 3,964,864 to Dahms is respectfully traversed.

Claim 10 defines patentably over the patents to Helms, et al., and Horsman, et al., for the same reasons as claim 9 and Dahms does not cure the failure of Helms, et al., and Horsman, et al., to disclose the problem solved by the invention and the structure covered by claims 10. Dahms does not provide a suggestion for combining the teachings in Helms, et al., and Horsman, et al.

Claim 3 objected to as being indefinite and claims 11, 12 and 30 objected to as being dependent upon rejected claims are rewritten in independent form. Since no prior art has been cited against these claims, it is respectfully requested that they be allowed.

Since the claims in this application are proper under 35 U.S.C. 112 and patentable under U.S.C. 102 and 103, it is respectfully requested that they be passed to issue.

Respectfully submitted,

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